AIRSPEED

- Did you ever wonder why it is possible to fly an airplane, in slow flight, below that airplane’s indicated stall speed?
- Is it all because of the power-on effect on reduction of stall speed?
- Or is it because you’re comparing apples and oranges (stall IAS vs. CAS)?

AIRSPEED

- Do you ever note whether a handbook speed is “calibrated” or “indicated”?
- For example, T-34 NATOPS text provides recommended procedures in terms of IAS, but all performance charts are in CAS
- Are the Vy’s, Vx’s, and Va’s, which you have memorized, in CAS or IAS?

AIRSPEED

(Much of the following is from "Aviation Safety, March 2000")

- In ground school learned IAS vs. CAS vs. TAS
- Use TAS to compute cross-country data, but probably forgot distinctions between IAS and CAS
- Obviously, landings are highly dependent on proper control of airspeed during approach

AIRSPEED

- Remember that recommended approach speed is 1.3 Vso (or 1.15 Vso, over the threshold, for short fields)
- Can you look at airspeed indicator and then just multiply bottom of green or white arc by 1.3 to compute approach speed?
- COMPUTATION IS BASED ON <u>CAS</u>, *NOT* <u>IAS</u>!

AIRSPEED

Example:

- Cessna 172 recommended approach speed is 60 to 65 knots, per operating handbook
- Airspeed indicator shows bottom of green arc at 33 knots IAS (KIAS)
- 1.3 X 33 KIAS equals 43 KIAS
- Why doesn’t handbook recommend 43 KIAS for approach?

AIRSPEED

- Approaching at 43 KIAS, aircraft is high up back side of power curve and near stall, and not in a good attitude!
- Actually, *33 KIAS equals 46 KCAS* for the Cessna 172
- 1.3 X 46 KCAS equals 60 KCAS
- For Cessna 172, 60 KCAS is approx. equal to 60 KIAS
- Thus handbook value makes sense

AIRSPEED

Aircraft	IAS	40	50	60	70
Cessna 152	CAS	43	51	61	71
Cessna 172	CAS	49	55	63	72
T-41	CAS	59	63	71	
Cessna 182RG	CAS	50	55	63	72
Piper Archer	CAS	45	55	63	72

(*chart is for flaps down config*.)

AIRSPEED

- A second consideration for approach airspeed is effect of gross weight on stall speed
- Handbook approach speeds based on max gross weight

AIRSPEED

Example:

- Fly Grumman Cheetah, filled to tabs, with two occupants, for two hours
- Airplane then is down to 1850 lbs (2200 lbs max gross weight)
- Stall speed changes by square root of gross weight (square root of 1850/2200 = 92%)

AIRSPEED

- This results in approach speed being reduced from 79 mph to 73 mph
- Weight reduction of 350 lbs results in 5 to 6 mph reduction in stall speed
- So what? Landing at NHK, there’s no big concern
- Landing on short field without the speed reduction, however, airplane has 17% more kinetic energy!

AIRSPEED

- Excess kinetic energy could lead to airplane departing end of short runway
- In turbulence, floating longer because of excess energy results in longer exposure to effect of gusts

Bottom Line:

To make good landings - especially on short runways - know precise airspeed and keep airplane at that speed